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SYSTEMS AND METHODS FOR PROGRAMMING A SECURED CPLD ON-THE-FLY

FIELD OF THE INVENTION

[0001] The present invention relates to the area of programmable logic devices. In particular, the present invention relates to systems and methods for reprogramming a complex programmable logic device (CPLD) without halting system operation, when the programming data stored in the CPLD has been secured to prevent the reading or writing of the programming data. This application is a CIP of 10/233,243 filed 08/30/2002, now U.S. Pat. 6,714,041.

BACKGROUND OF THE INVENTION

[0002] Reprogrammable integrated circuits (ICs) provide a great deal of flexibility and control to circuit designers. For example, an in-system programmable (ISP) device can be programmed while installed in an electronic system (i.e., mounted on a circuit board with other components), thereby allowing modifications or upgrades to be performed on a completed product without replacing any hardware. In a complex programmable logic device (CPLD), this reprogrammability is typically provided by an EEPROM (electrically erasable programmable read-only memory) array.

[0003] Fig. 1 shows an electronic system 190 that includes a conventional CPLD 100. CPLD 100 comprises a configuration control circuit 110, an EEPROM array 120, and a configurable logic space 130 that includes a programmable interconnect matrix 131 and macrocells 132a-132d. Configuration control circuit 110 is coupled to receive an instruction INST and provide in response a configuration control signal CFG_CTRL that controls the loading of a set of configuration data CFG_DAT into EEPROM array 120. This in turn places interconnect matrix 131 and macrocells 132a-132d into a desired configuration.